

## **REMARKS**

### **I.           Introduction**

Claims 1 to 12 are pending in the present application, all of which have been rejected. Claim 4 has been amended to correct a typographical error, as corrected claim 4 depends from claim 1 and not claim 11. Further claim 4 has been amended merely to more clearly define the claimed subject matter. In view of the above amendments above and the following remarks applicants respectfully submit that the claims are now in condition for allowance.

### **II.           Rejection of Claims Under 35 U.S.C. § 112**

Claim 4 stands rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Office Action states that the meaning of the term “also” in the phrase “the second initiator is also added intermittently and/or continuously ...” is unclear because none of the base claims recite that the first initiator is added intermittently or continuously.

In response applicants have amended claim 4 to correct the dependency to claim 1 and as amended the phrase in claim 4 recites “the second initiator is additionally added intermittently and/or continuously ...”. This recitation reflects that according to claim 1 the second initiator is also added intermittently and/or continuously at an earlier stage of the process to which claim 4 is directed to. Applicants submit that these amendments to claim 4 more clearly define the claimed subject matter. Thus, Applicant respectfully submits that the rejection of claim 4 under 35 U.S.C. § 112, second paragraph, has been overcome and should therefore be withdrawn.

### **III. Rejections of Claims Under 35 U.S.C. § 103**

Claims 1-8, 11, and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 1995-082304 (“Amano”), based on the computer-generated English translation of Amano as referred to in the Office Action. Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Amano in view of U.S. Patent No. 6,274,690 (“Hoshida et al.”). Claims 1-8 and 10-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Amano in view of U.S. Patent No. 6,384,155 (“Van Swieten et al.”). Claim 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Amano in view of Van Swieten et al and Hoshida et al. Applicant respectfully submits that these rejections should be withdrawn for at least the following reasons.

The Office Action asserts that Amano discloses a process to polymerize one or more monomers using an amount of initiator that does not cause an uncontrolled reaction and a second initiator having a half-life of 0.1 hours at the reaction temperature, wherein the second initiator is dosed at least partially in between the start of the polymerization until 60% (preferably 50%) of the monomer has been polymerized. According to the Office Action Amano further gives an example in which the second initiator is dosed when 15% of the monomer has been polymerized. According to the Office Action the reference fails to specifically name that at most 90% of a safely useable amount of a first initiator is used and that the second initiator is dosed at least partially in between the start of the polymerization until 10% of the monomer has been polymerized. The Office Action also asserts that Amano fails to specifically name a process in which at least 92% of the maximum cooling capacity is used during a period of time in which at least 10 wt% of the monomer is polymerized. However, the Office Action asserts that Amano teaches that a reflux condenser is used to prevent the reaction from exceeding a desired temperature and thus an operator may adjust the coolant flow through the condenser in order to achieve a desired cooling capacity for the

reactor. Further, according to the Office Action the reference recognizes that the condenser is in operation prior to dosing the very reactive initiator in order to prevent the reaction from exceeding a desired temperature. According to the Office Action the second (very reactive initiator is used in order to shorten the reaction time. With respect to the requirement in the claimed invention to add the second initiator at least partially between the start of the polymerization until 10% of the monomer has been polymerized, the Office Action states that Amano refers to a monomer conversion of up to 50% and further gives an example in which the second initiator is added at 15% monomer conversion. According to the Office Action in view of this the skilled artisan would have expected the same properties from the resulting reaction. According to the Office Action the skilled artisan would expect that adding an initiator at a different point in the reaction would lead to predictable changes in the polymer's properties, such as molecular weight, molecular weight distribution, and processability characteristics. Moreover the Office Action states that the point of commencement and the duration of the initiator feed are result effective variables because changing them will clearly affect the type of product obtained, including the polymer's physical properties. According to the Office Action discovery of an optimal value of a result effective variable in a known process is ordinarily within the skill of the art.

With respect to Van Swieten et al. the Office Action asserts that the reference teaches that using a reactive peroxide in the early stage of polymerization allows for fast heating up, and further teaches that dosing the peroxide allows for control of the polymerization rate. According to the Office Action the skilled artisan would recognize that adding the second initiator of Amano earlier in the process would allow for faster heating up, thereby shortening the reaction time and increasing throughput of the reactor. Further the Office Action asserts that Van Swieten et al teaches that the process of Amano may lead to an undesirable amount of residual peroxide in the polymer and thus the skilled artisan would be

motivated to optimize the relative proportion of the first (more stable) initiator and the second (less stable) initiator in the process of Amano, including using less of the first and more of the second initiator, so as to minimize the amount of residual peroxide in the polymer.

With respect to the rejection of claim 9, the Office Action asserts that in view of Hoshida, disclosing polymerizing vinyl chloride monomer with reactors of at least 40 m<sup>3</sup>, it would have been obvious to the skilled artisan to have scaled up the process of Amano or Amano in view of Van Swieten et al. Therefore, it would have been obvious to the skilled artisan to modify the process in Amano to arrive at the currently claimed invention.

Applicant respectfully disagrees with these assertions for at least the following reasons. Applicants submit that Amano does not disclose nor suggest the presently claimed invention considering that the cited reference fails to teach or suggest a second initiator “dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized, which deficiency is not cured by the secondary references cited by the Examiner. It appears that the Examiner has applied impermissible hindsight analysis to piece together applicants’ invention. See, *In re Fitch*, 972 F.2d 1260 (Fed. Cir. 1992) (“ [I]t is impermissible to use the claimed invention as an instruction manual or template to piece together the teachings of the prior art so as that the claimed invention is rendered obvious ..... This court has previously stated that “[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.”); quoting from *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). See also *In re Zurko*, 111 F.3d 887 (Fed. Cir. 1997), *reh’g in banc granted*, 116 F.3d 874 (Fed. Cir. 1997), *rev’d*, 142 F.3d 1447 (Fed. Cir. 1998), *rev’d sub nom. Dickinson v. Zurko*, 527 U.S. 150 (1999), *on remand*, 258 F.3d 1379 (Fed. Cir. 2001) (“[T]o say that the missing step comes from the nature of the problem to be solved begs the question because the Board has failed to show that this problem had been previously identified anywhere in the prior art.”). Therefore, the

rejections raised under 35 U.S.C. § 103(a) over Amano, or Amano in view of Hoshida et al, or Amano in view of Van Swieten et al, or a combination thereof, are apparently based on improper hindsight. Further, in determining obviousness, “the inquiry is not whether each element existed in the prior art, but whether the prior art made obvious the invention as a whole for which patentability is claimed.” *Hartness International Inc., v. Simplimatic Engineering Co.*, 819 F.2d 1100 (Fed. Cir. 1987), see also *Custom Accessories, Inc., v. Jeffrey-Allan Industries Inc.*, 807 F.2d 955 (Fed. Cir. 1986) (“[c]asting an invention as a combination of old elements leads improperly to an analysis of the claimed invention by parts, not by the whole.”). For this reason alone applicants submit that the claimed invention is not taught or suggested by the cited references.

Applicants submit that Amano starts to add the second initiator only after the start of the heat dissipation by the reflux condenser (par. 0011), which is after reaching a monomer conversion of 15% or more (par. 0014). Therefore, the cited reference starts with said addition of a second initiator after having reached 15% conversion, while the claimed invention requires such addition within the first 10% conversion. The reasoning in Amano to require addition of the second initiator only after 15% conversion is given in par. 0011:

“if the highly active oil soluble polymerization initiator is added before the start of the heat dissipation by the reflux condenser, the polymerization reaction heat increases to exceed the limit of heat dissipation capability of the jacket, causing such disadvantages that it becomes difficult to keep the temperature in the polymerization reactor at a predetermined temperature, and that fish-eyes increase in the obtained polymer”.

This same issue of keeping the temperature at a predetermined level despite the reaction heat evolved, also forms the basis of the presently claimed invention. However, contrary to the claimed invention Amano chooses to add 100% of the safely useable amount of the first initiator (par. 0004), resulting in the inability to add any second initiator before heat dissipation by the reflux condenser (i.e. after 15% conversion). The present invention, on the

other hand, chooses to add less first initiator (not more than 90% of the safely useable amount) thereby leaving room for the addition of the second initiator at an earlier stage, i.e. within the first 10% of conversion.

As an additional advantage over the process of Amano, the process of the currently claimed invention has an improved distribution of the first initiator over the monomer, resulting in polymer particles with less defects such as fish-eyes (present application, page 2, lines 19-24). Considering that Amano does not teach or suggest to use less than 100% of the safely useable amount of first initiator, nor to the dosing of the second initiator within the first 10% of convention, the skilled artisan reading the Amano disclosure as a whole would not arrive at the claimed invention of a process requiring at most 90 percent by weight of the safely useable amount of a first initiator and a second initiator, having a half-life from 0.0001 hour to 1.0 hour at the polymerization temperature and that is less temperature stable than said first initiator, being dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized. Moreover, Amano clearly teaches against addition of the second initiator before 15% convention.

Furthermore, Van Swieten clearly teaches not to use Amano's first initiator at all. This is evident for example in the paragraph bridging pages 2 and 3, where Van Swieten et al refers to Amano and states that the use of a more stable peroxide at the beginning of the polymerization results in an unacceptably high residue of peroxide in the final polymer. This is confirmed by Van Swieten's Comparative Example F, which also resulted in a high amount of peroxide residue. Van Swieten et al thus teaches against the process as in Amano. Therefore, the skilled artisan reading the entire disclosure of Van Swieten et al would not be motivated to combine the teachings of Van Swieten et al with Amano to arrive at the currently claimed invention. Thus one cannot conclude that "the skilled person of ordinary skill would recognize that adding the second initiator of Amano earlier in the process would

allow faster heating up, thereby shortening the reaction time and increasing the throughput of the reactor" because the skilled artisan would realize at the same time that this would lead to an unsafe situation, as Amano clearly teaches:

- Par. 0003: Increasing the amount of initiator increases the caloric value, requiring increased heat dissipation capacity. If heat is dissipated from the reflux condenser within the first 15% conversion, coarse particles or even blocks may be formed. As a result, the reflux condenser cannot be used at this stage.

- Par. 0011: "If the highly active oil soluble polymerization initiator is added before start of the heat dissipation by the reflux condenser, the polymerization reaction heat increases to the exceed the limit of heat dissipation capability of the jacket, causing such disadvantages that it becomes difficult to keep the temperature in the polymerization reactor at a predetermined temperature, and that fish eyes increase in the obtained polymer".

In other words, faster heating up or the addition of the second initiator within the first 15% conversion is simply not allowed in Amano's process.

The skilled artisan, reading Amano or Amano in view of Van Swieten et al and desiring to increase the initiator efficiency (that is: a process which requires less initiator) and use the maximum cooling capacity, would have no guidance from the cited reference(s) on how to achieve this, let alone that such a skilled artisan would be inclined to achieve this by using at most 90 wt% of the safely usable amount of a first initiator, to dose the second initiator within the first 10% conversion and in an amount such that at least 92% of the maximum cooling capacity is used in this 10% conversion. Therefore, applicants respectfully submit that the currently claimed invention is not obvious in view of Amano or Amano in view of Van Swieten et al.

In addition, Hoshida et al. does not cure the shortcomings of Amano or Amano in view of Van Swieten et al. That is, Hoshida et al. fails to teach or suggest a second

initiator “dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized.”

Therefore, none of the cited references, alone or in combination, teach or suggest the presently claimed process which includes a second initiator “dosed at least partially from the start of the polymerization until 10% of the monomer(s) has been polymerized.” For at least the preceding reasons, it is respectfully submitted that the rejections under 35 U.S.C. §103(a) have been overcome and should therefore be withdrawn.

#### IV. Conclusion

In view of the preceding remarks, it is respectfully submitted that the application is in condition for allowance and prompt consideration is respectfully requested.

Respectfully submitted,  
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